

1963/119  
B

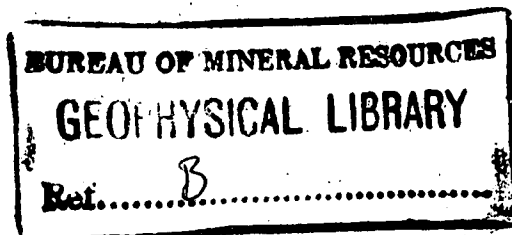
COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF NATIONAL DEVELOPMENT

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

061680

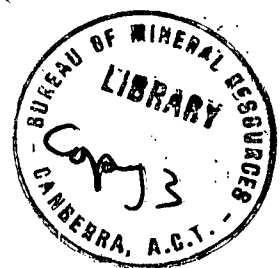
RECORD No. 1963/119



CANBERRA NATIONAL LIBRARY

SITE RESISTIVITY

SURVEY 1962



by

*E.E. JESSON and L. KEVI*

The information contained in this report has been obtained by the Department of National Development as part of the policy of the Commonwealth Government to assist in the exploration and development of mineral resources. It may not be published in any form or used in a company prospectus or statement without the permission in writing of the Director, Bureau of Mineral Resources, Geology and Geophysics.

COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF NATIONAL DEVELOPMENT

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

---

RECORD No. 1963/119

CANBERRA NATIONAL LIBRARY  
SITE RESISTIVITY  
SURVEY 1962

*by*

*E.E. JESSON and L. KEVI*

The information contained in this report has been obtained by the Department of National Development, as part of the policy of the Commonwealth Government, to assist in the exploration and development of mineral resources. It may not be published in any form or used in a company prospectus or statement without the permission in writing of the Director, Bureau of Mineral Resources, Geology and Geophysics.

## CONTENTS

	Page
SUMMARY	
1. INTRODUCTION	1
2. RESULTS	1
3. CONCLUSION	2
4. REFERENCES	2

## ILLUSTRATIONS

Plate 1. Location map (Drawing No. I55/B5-1)

Plate 2. Resistivity profiles and resistivity histogram (I55/B5-2)

## SUMMARY

A resistivity survey at the National Library Site, Canberra, disclosed a low-resistivity zone at a depth of about 145 to 235 ft; the zone may be interpreted as a fault.

## 1. INTRODUCTION

Diamond-drilling and geological work at the proposed National Library site in Canberra, ACT indicated a fault with northerly strike, dipping flatly towards the east. The fault zone probably continues at depth beneath the proposed foundations, and if the fault zone is too shallow, it might cause a land slip (Plate 1).

To check the location of the fault, the Geological Branch of the Bureau of Mineral Resources, Geology and Geophysics requested some geophysical work. The survey was made by E.E. Jesson, party leader, and L. Kevi, geophysicist, with 5 field assistants, on the 28th November and 6th December 1962.

The geophysical survey comprised electrical resistivity traversing (Wenner configuration, electrode spacing 50 ft) extending over 2200 feet along Traverses A, B, and C, and two 'Lee' electrical depth probes (variation on Wenner method) centred on G7 (Heiland, 1946). Because of recent excavation work, it was not possible to carry out depth probes at other places in the area.

For a geological description of the site reference is made to Gardner (in preparation).

## 2. RESULTS

In a fault or shear zone, owing to an increase in porosity and to weathering near the surface, the resistivity is generally expected to be lower than in the surrounding rocks. Using this criterion, the low-resistivity zones along Traverses A, B, and C are interpreted as the regions where the fault zone intersects the surface (Plates 1 and 2). The position of the fault indicated by the resistivity method is roughly the same as the one deduced from geological observations, the strike of the former being about 020 degrees compared with the northerly strike of the latter.

Disregarding the top 10 ft near the surface, the resistivity depth probe near G7 shows:

- (a) a layer of resistivity 90 to 100 ohm-m to a depth of about 80 ft; this layer is interpreted as moderately weathered to slightly weathered bedrock,
- (b) a layer of resistivity more than 220 ohm-m extending from about 80 ft to about 145-ft depth; this layer is interpreted as slightly to unweathered bedrock,
- (c) a low-resistivity zone (roughly 75 ohm-m) from about 145 ft to about 235-ft depth; this low-resistivity zone may represent the flatly-dipping fault zone suggested by geological evidence,
- (d) below 235-ft depth the high resistivities indicate unweathered bedrock.

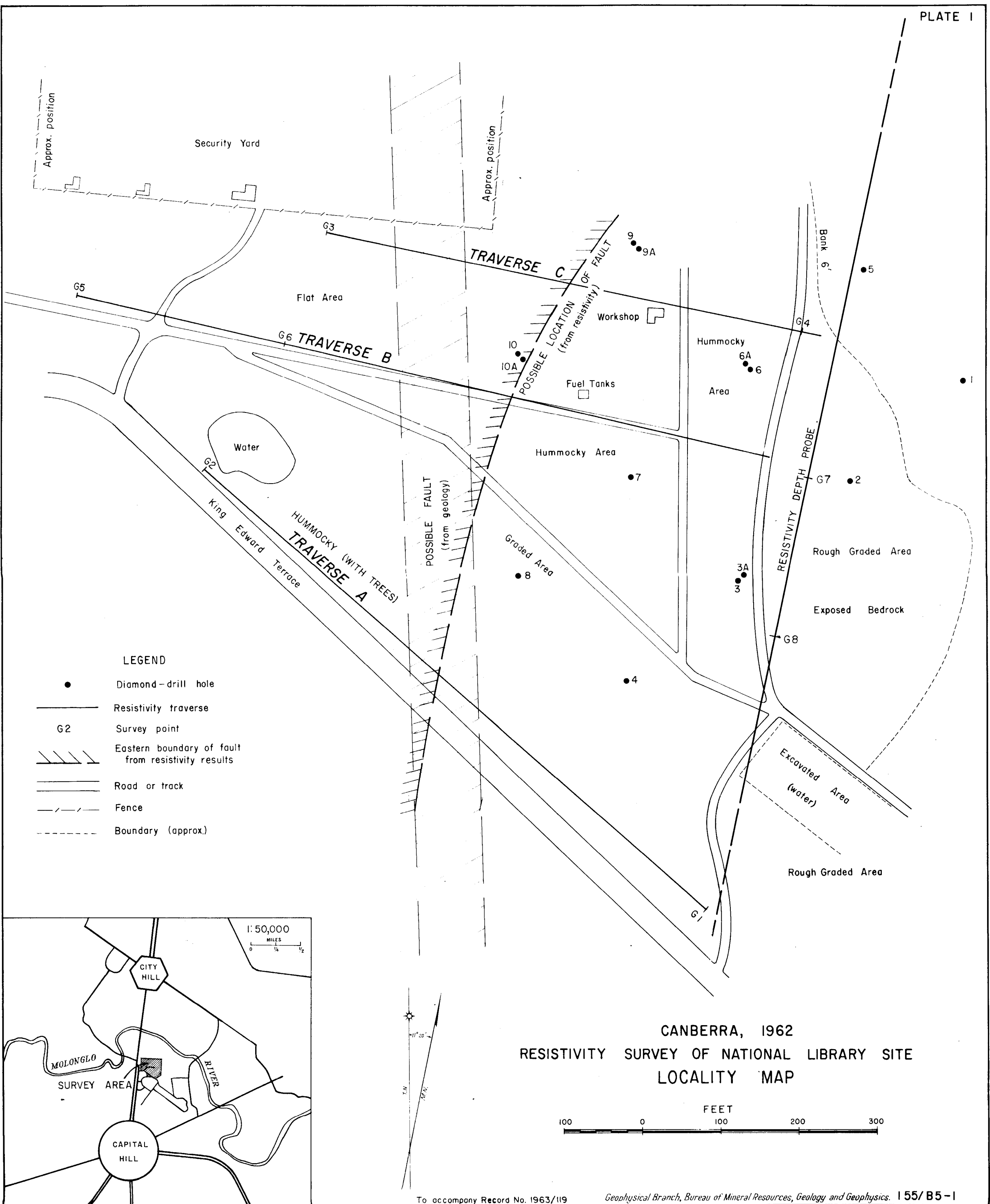
2.

3. CONCLUSION

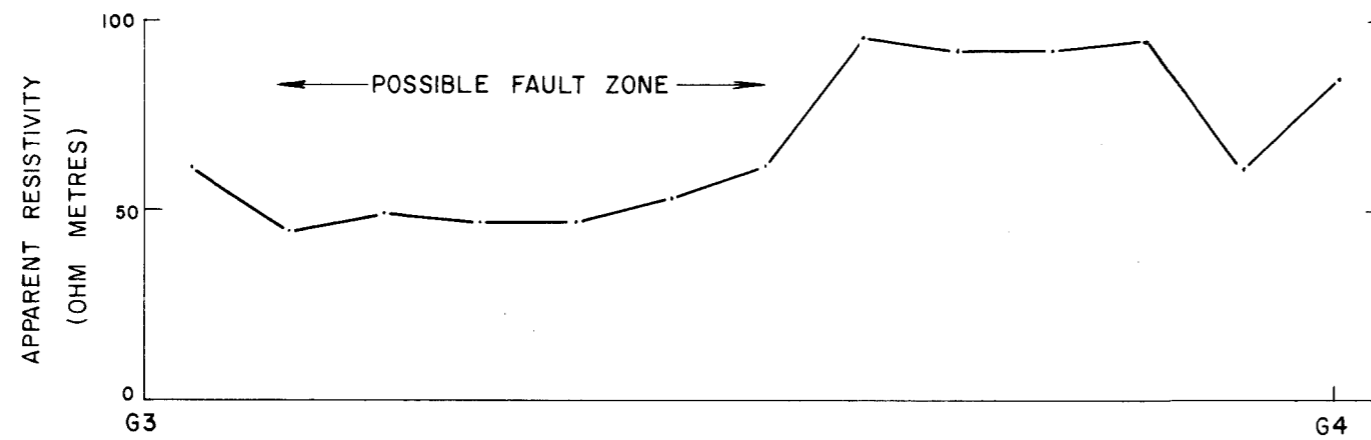
A low-resistivity zone at a depth exceeding 100 ft near G7 may represent a flatly-dipping fault zone. However, the depth in the eastern part of the area is probably too large to have any practical consequence on the design of the foundations. If it is desired to check the geophysical results, a hole should be drilled at G7 to a depth of about 240 ft.

4. REFERENCES

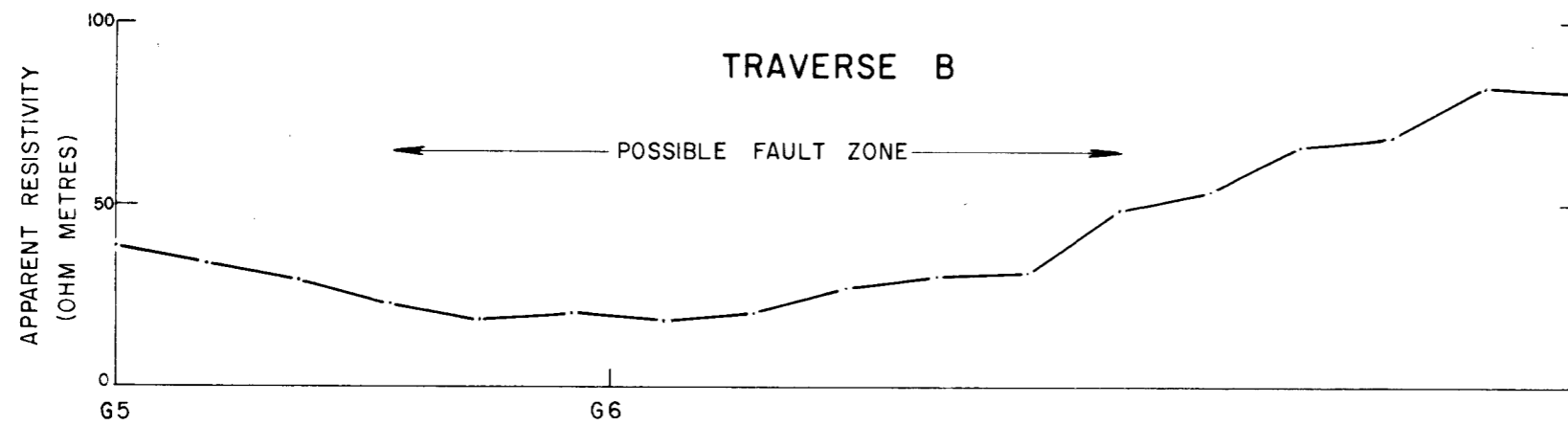
- |               |      |   |
|---------------|------|---|
| GARDNER, D.E. | -    | Geological and geophysical investigation of foundations, National Library Site, Canberra. <u>Bur. Min. Resour. Aust. Rec.</u> (in preparation). |
| HELLAND, C.A. | 1946 | GEOPHYSICAL EXPLORATION. New York, Prentice Hall.   |



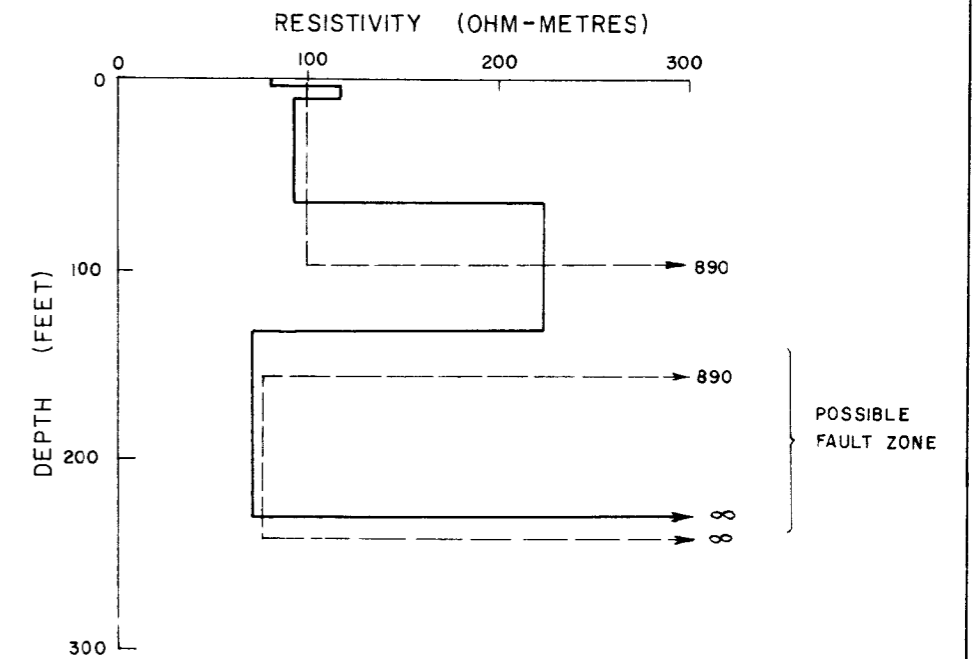
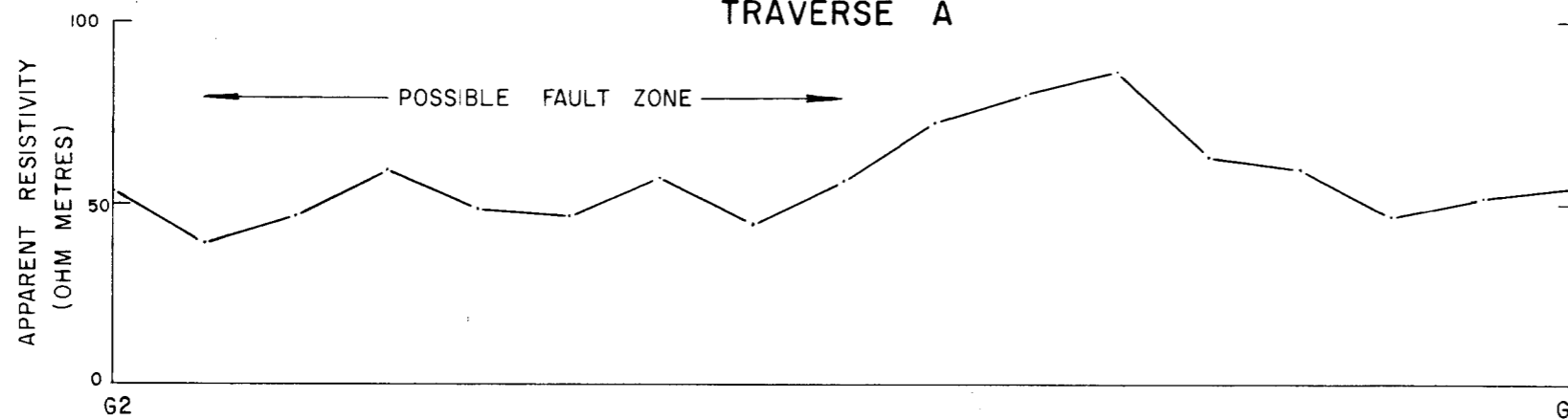
### TRAVERSE C



### TRAVERSE B



### TRAVERSE A



HISTOGRAM OF DEPTH v. RESISTIVITY  
FROM DEPTH PROBE NEAR G7  
(LEE METHOD)

— North of G7  
- - - South of G7

### RESISTIVITY SURVEY

